

**REMARKS**

Claims 22, 28 and 30 are allowed; claims 23-27, 29 and 31-42 are rejected.

Review and reconsideration on the merits are requested.

In paragraph 1 at pages 2-3 of the Office Action, claims 23-27, 32, 35, 37 and 41 were rejected under 35 U.S.C. § 112, first paragraph. In paragraph 2 at pages 4-5 of the Office Action, claims 29, 31, 33-34, 36, 38 and 42 were rejected under 35 U.S.C. § 112, first paragraph. In paragraph 3 at pages 5-6 of the Office Action, claims 39 and 40 were rejected under 35 U.S.C. § 112, first paragraph.

The grounds for the above rejections are that the limitation “wherein the boron phosphide (BP)-based buffer layer is a monolayer” is not disclosed in the specification as originally filed and therefore lacks written description support.

The Examiner understands “monolayer” as meaning a single or continuous film of one cell or molecule in thickness, and comments that even a thickness of 45 nm is far too thick for a BP monolayer. The Examiner also comments that none of Examples 1 and 2 and Fig. 2 disclose or illustrate a buffer layer that is a monolayer.

Applicant replies as follows.

Although intended to connote a single layer to thereby distinguish over Terashima et al where the buffer layer constitutes three distinct layers, the Examiner ascribed the term “monolayer” to mean a layer of one cell or molecule in thickness. Accordingly, the claims have been amended to characterize the buffer layer as being in the form of a single layer arranged between the single crystal substrate and double hetero-junction light-emitting part structure. The

thickness of the buffer layer of 45 nm mentioned in Example 1 of the present specification corresponds to 100 cells.

As to the second point raised by the Examiner, the Remarks portion at page 7, line 1 of the Amendment filed May 16, 2006 should have referred to Fig. 3 instead of Fig. 2. Fig. 3 which is associated with Example 2 illustrates a double hetero (DH) structure including single crystal substrate 1, BP low-temperature buffer layer 2, lower clad layer 3, light-emitting layer 4 and upper clad layer 5. Notably, as shown in Fig. 3, buffer layer 2 is in the form of a single layer. This is in contrast to the double hetero (DH) structure of Fig. 4 which is associated with Example 3, illustrating BP-based buffer layer 9 composed of a double layer structure of a low-temperature buffer layer 2 and crystalline buffer layer 8 grown at a higher temperature (page 22, lines 27-29 of the specification). Because the specification as originally filed exemplifies double hetero (DH) structures having, in one embodiment, a buffer layer in the form a single layer and in another embodiment a buffer layer in the form of a double layer structure, the specification shows that Applicants had possession of a double hetero (DH) structure including a boron phosphide (BP)-based buffer layer in the form of a single layer at the time that the application was filed.

It is respectfully submitted that the claims as amended fully comply with 35 U.S.C. § 112, and withdrawal of the foregoing rejections is respectfully requested.

Withdrawal of all rejections and allowance of claims 22-42 is earnestly solicited.

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 10/753,393

Attorney Docket No. Q79052

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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